

## THE TAXONOMY OF SOME INDO-PACIFIC MOLLUSCA

Part 3. With descriptions of new taxa and remarks  
on an Ecuadorian fossil species of Turridae

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*Abstract.* A new subgenus is proposed for the Austral-Neozelanic nassariid species *Nassarius ephamillus* (Watson) and the species synonymy and distribution is discussed. *Eucyclotoma hindsii* (Reeve), *Cymatium armatum* (Sowerby) and *Distorsio pusilla* are defined and recorded from the Pacific while *Pseudoneptunaea varicosa* (Roeding) is localised from Thailand. Two new species of *Microvoluta* from East Australia are described. *Venassa v. Martens*, is considered to have been based on a teratological individual of *Nassarius (Zeuxis)* species. The following species are re-assigned: "Nassa" *semitexta* Hedley, from the Nassariidae to the Rissoacea; *Mitre stadialis* Hedley, from the Mitridae to the Volutomitridae; the Ecuadorian Mio/Pliocene *Mitra (Subcancilla) musa* Olson, from the Mitridae to the Turridae. The turrid genus *Mirithara* Hedley, 1922, is considered to be synonymous with *Mitrolumna* Bucquoy, Dautzenberg & Dollfuss, 1883.

For previous publications in this series see Cernohorsky (1972, 1974a).

### Family CYMATIIDAE

(The validity of the family name is currently under consideration by the I.C.Z.N.).

#### Genus *Cymatium* Roeding, 1798

##### Subgenus *Ranularia* Schumacher, 1817

*Ranularia* Schumacher, 1817, Essai nouv. syst. p. 253. Type species by SD (Gray, 1847) *M. clavator* = *Ranularia longirostra* Schumacher, 1817 = *Tudicla gutturnium* Roeding, 1798.

The type designation is usually credited to Hermannsen (1848), however, Gray's (1847) designation is 3 months prior.

#### **Cymatium (Ranularia) armatum** (Sowerby, 1897)

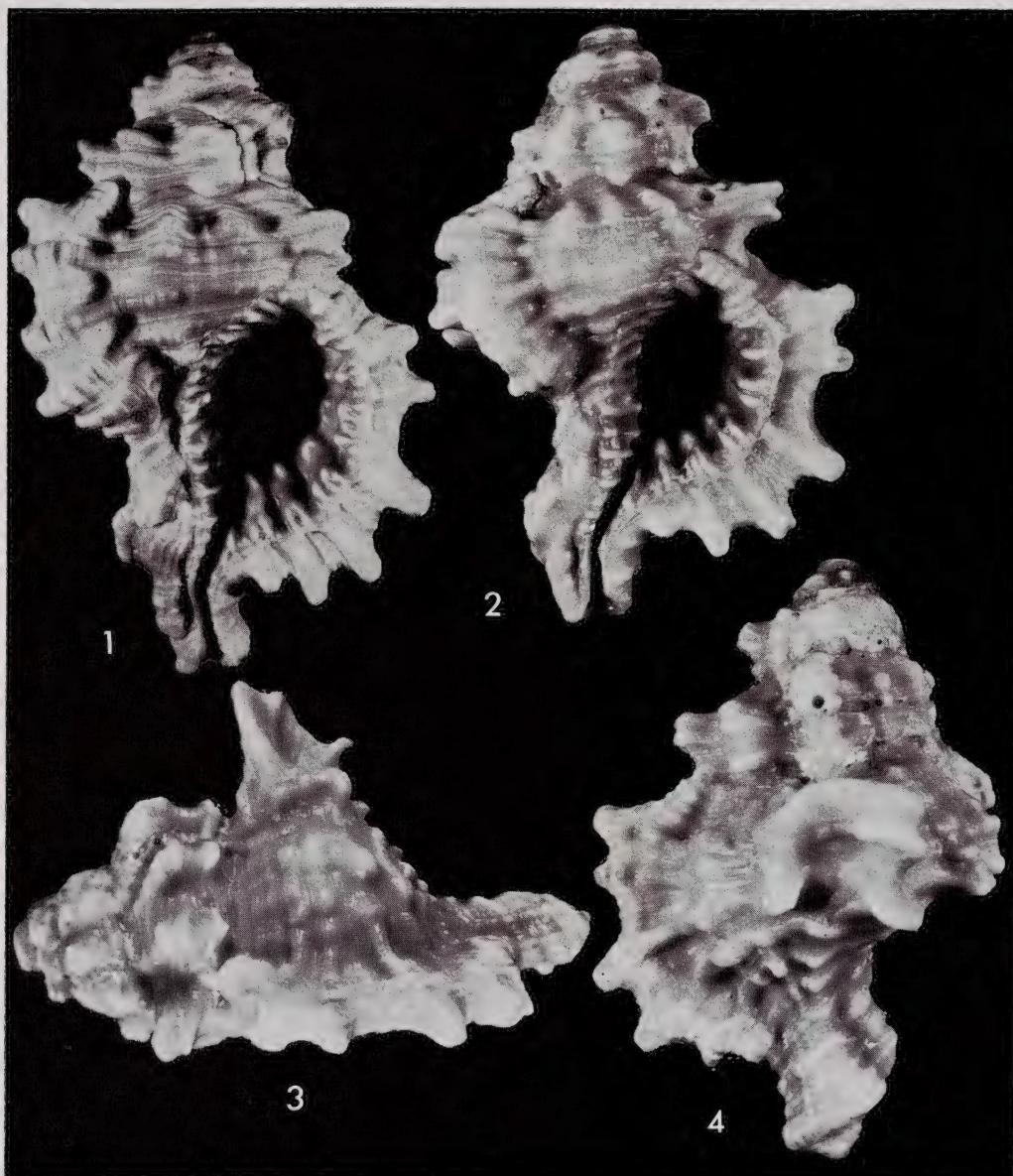
(Figs. 1-4)

1897. *Lotorium armatum* Sowerby, Proc. Malac. Soc. Lond. 2: 137, pl. 11, fig. 1.  
1933. *Cymatium armatum* (Sowerby), Bayer, Zool. Meded. Rijks Mus. Nat. Hist. 16: 47.

**TYPE LOCALITY.** Marquesas Is?

The species has not been illustrated nor reported since the date of its description. The recent collection of 2 storm-tossed specimens from Pango Pt., Efate I, New Hebrides (leg. H. Dale), confirm the species occurrence in the Pacific. The species exceeds 50 mm in length (holotype 67.5 mm), has 2 strong varices per whorl which

are crossed by strong ribs, the dorsum has an erect, three-leaved, shovel-like extension, the siphonal canal is twisted, the columella has 16 plicae, the outer lip 11 and the edge of the outer lip is sculptured with 6 digitations. The colour is tan with paler areas, the aperture is reddish-orange, the columella is streaked with chocolate-brown and the plicae are whitish.



Figs. 1-4. *Cymatium (Ranularia) armatum* (Sowerby). 1. Holotype BMNH No. 1897.4.30.2., length 67.5 mm, width 41.4 mm. 2-4. Specimen from Pango Pt., Efate I, New Hebrides; 57.4 × 40.4 mm.

*Cymatium lotorium* (Linnaeus) has a similar coarse sculpture and twisted siphonal canal but the columella is differently sculptured and the outer lip lacks the protruding digitations of *C. (R.) armatum*.

Genus **Distorsio** Roeding, 1798

Subgenus **Personella** Conrad, 1865

*Distorsio (Personella)* Conrad, 1865, Amer. J. Conch. 1: 21. Type species by *M. D. septem-dentata* Gabb, 1860. Eocene of Texas.

**Distorsio (?) Personella pusilla** Pease, 1861

(Figs. 5-9)

- 1861. *Distorsio pusilla* Pease, Proc. Zool. Soc. Lond. for 1860, Pt. 28: 397; 1881 Tryon, Man. Conch. 3: 35; 1946 Edmondson, Spec. Publ. Bishop Mus. No. 22: 123; 1952 Kuroda & Habe, Chek-list Mar. Moll. Jap. p. 53; 1960 Azuma, Cat. Moll. Okinawa p. 31; 1965 Kay, Bull. Brit. Mus. (Nat. Hist.), Zool. Suppl. 1: 37, pl. 3, figs. 15, 16 (figd. holotype).
- 1878. *Persona pusilla* Pease, Kuester & Kobelt, Syst. Conch. Cab. Mart. Chemnitz, ed. 2, 3 (2): 273.
- 1953. *Distorsio (Personella) pusilla* Pease, Emerson & Puffer, Proc. Biol. Soc. Washington 66: 102.

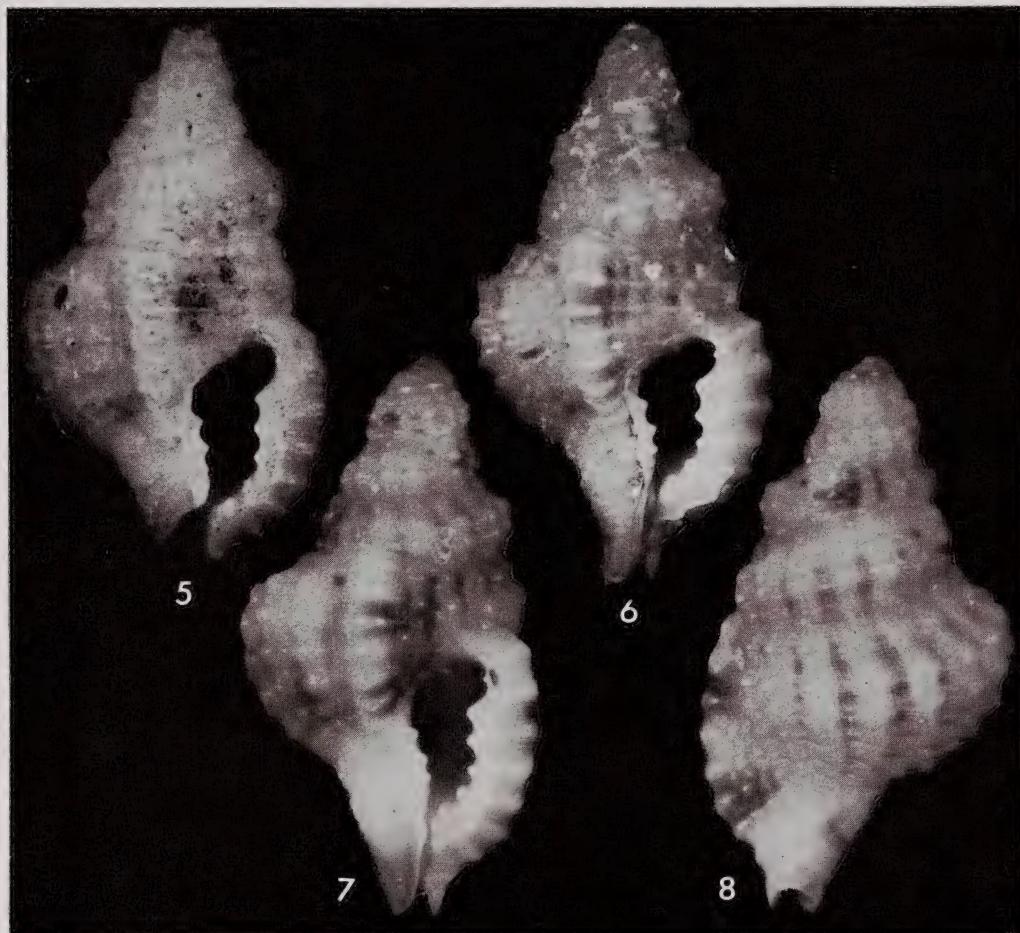
TYPE LOCALITY. Sandwich Is [= Hawaiian Is].

Shell small, 8-10 mm in length, protoconch consisting of 2½ to 3 smooth, glassy, ember-coloured embryonic whorls, penultimate embryonic whorl with a dark brown band; teleoconch of 4½ whorls with 7 varices, varices very weak on spire whorls and visible only under magnification. Sculptured with c. 15 axial ribs and 4 nodulose cords on the penultimate and 12 ribs and 7 spiral cords on the body whorl with an additional 5 cords on the siphonal fasciole; the moderately deep interspaces are finely cancellate. Outer lip with 7 prominent denticles, first adapical denticle minute, second denticle largest, subsequent denticles only fractionally smaller; columella with 4 denticles, columellar callus narrow and confined to the aperture. Golden-fawn in colour, ornamented with a few brown streaks and blotches, outer lip white and with 2 brown streaks on the dorsal side of the varix, siphonal fasciole white.

The comparative rarity of this minute *Distorsio* has been responsible for the obscure identity of the species. Emerson and Puffer (1953) suggested that *D. pusilla* would appear to be a geographical subspecies of *D. reticulata* Roeding, 1798. *D. pusilla* is not only sympatric with *D. reticulata* in the Pacific, but also differs appreciably from *D. reticulata* and other members of the subgenus *Rhysema* Clench & Turner, 1956. The whorls are less distorted, the spreading columellar callosity is lacking, the deep anal and lateral columella excavation and sharply bent, closely denticulate columella are absent and in the *D. reticulata* group of species the third or fourth adapical denticle is accentuated and the outline of the body whorl almost completely merges with the siphonal fasciole. In *D. pusilla* the siphonal canal is straighter and the hairy periostracum is lacking.

*D. pusilla* is considerably closer in morphological features to the presumably extinct *Personella* Conrad, 1865, from the American Tertiary and closely resembles the New Zealand Eocene *D. (P.) beui* Maxwell, 1968, in apertural features and arrangements of denticles. Wrigley (1932) stressed the importance of the number and arrangement of the denticles on the outer lip and described *Personella* as having 8 denticles and the related *Sassia* Bellardi, 1873, only 7 denticles. *Distorsio pusilla* does have only 7

denticles on the outer lip as in *Sassia*, but species of the latter group have a different protoconch and the denticles are laid in a regular, concave curve. In species of *Rhysema*, the number of denticles on the outer lip fluctuates from 8-10 and in *Personella* and *Sassia* from 7-8.



Figs. 5-8. *Distorsio* (? *Personella*) *pusilla* Pease. 5. Holotype BMNH No. 1961155; 9.9 × 5.3 mm. 6-8. Specimens from Nth. Tipilao Pt., Guam I, Marianas Is. 6, 7.8 × 4.1 mm. 7, 8. 9.9 × 5.0 mm.

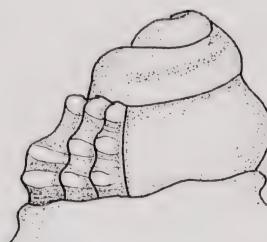


Fig. 9. *Distorsio* (? *Personella*) *pusilla* Pease. Protoconch.

The recent specimens described and illustrated were collected at Nth. Tipilao Pt., Guam I, Marianas Is, in 11 m, under rocks (leg. R. Salisbury). The species has been previously reported from Japan and the Hawaiian Is. The holotype of *D. pusilla* (Fig. 5) is in the British Museum (Nat. Hist.) No. 1961155, dimensions length 9.9 mm, width 5.3 mm, and is a worn and faded specimen with part of the protoconch and siphonal canal missing.

#### Family BUCCINIDAE

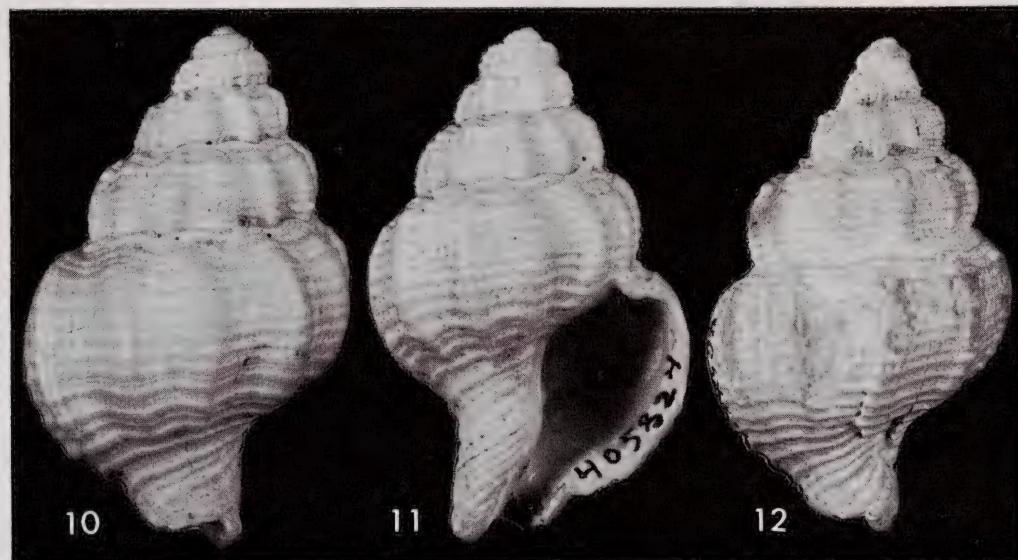
##### Genus **Pseudoneptunea** Kobelt, 1882

*Pseudoneptunea* Kobelt, 1882, Jahrb. deut. Malak. Gesell. 9: 17. Type species by SD (Cossmann, 1901) *Siphon. varicosa* Kien. = *Neptunea varicosa* Roeding, 1798. Recent, Indo-Malaya.

##### **Pseudoneptunea varicosa** (Roeding, 1798)

(Figs 10-12)

- 1788. "Murex varicosus" Chemnitz, Syst. Conch. Cab. 70: 256, pl. 162, figs. 1546-47 (Cape of Good Hope = error) [non binom.].
- 1791. *Murex rubecula* (pars) Gmelin, Syst. Nat. ed. 13: 3535 (ref. Chemnitz, *op. cit.*, figs. 1546-47 and 6 other references) [non Linnaeus, 1758].
- 1798. *Neptunea varicosa* Roeding, Mus. Bolten. p. 116 (ref. Chemnitz, *op. cit.*, figs. 1546-47) (Hab: ?).
- 1802. *Murex varicosus* Holten, Enum. syst. Conch. Chemnitzii p. 63 (ref. Chemnitz, *op. cit.*, fig. 1546).
- 1895. *Siphonalia bantamensis* K. Martin. Samml. geol. Reichs-Mus. Leiden, N.F. 1 (2): 97, pl. 16, fig. 218bis, 218a, b (Tjikeusik, Bantam, Pliocene of Java).
- 1939. *Siphonalia (Pseudoneptunea) varicosa* (Anton), Oostingh, Ing. Ned.-Indie Mijnb. Geol. 6 (82): 109 (Pangkalpinang, Banka and Mampawah, W. Borneo, Indonesia).
- 1939. *Siphonalia (Pseudoneptunea) bantamensis* (K. Martin), Oostingh, Ing. Ned.-Indie Mijnb. Geol. 6 (8): 109, pl. 13, fig. 236.
- 1974. *Siphonalia varicosa* (Roeding), Cernohorsky, Rec. Auckl. Inst. Mus. 11: 179, fig. 53 (figd. syntypes).



Figs. 10-12. *Pseudoneptunea varicosa* (Roeding); Sichol, Nakhon Si Thammarat, E. coast of Gulf of Thailand, USNM No. 405824. 10, 11. 31.0 × 18.8 × 18.0 mm. 12. 39.0 × 23.3 × 20.8 mm.

In a recent revision of Chemnitz's type specimens of Mollusca in the Copenhagen Museum (Cernohorsky, 1974b), the buccinid species *Pseudoneptunea varicosa* (Roeding), variously reported from Peru, Sth. America, Sth. Africa and Indonesia, remained unlocalised. Dr H. Rehder, Smithsonian Institution, Washington, kindly drew my attention to the existence of 2 beach specimens of the species in the collection of the National Museum of Natural History, Washington, USNM No. 405824, collected in 1929 at Sichol, Nakhon Si Thammarat, E. coast of the Gulf of Thailand (Figs. 10-12). These specimens have subangulate whorls and a sculpture of crisp main spirals with an occasional intermediate spiral thread. *Siphonalia bantamensis* K. Martin, 1895, from the Java Pliocene is obviously conspecific with the recent species, and *Pseudoneptunea varicosa* is therefore confirmed from the Indo-Malay region. *Siphonalia* (*Pseudoneptunea*) *inflata* Oostingh, 1941, from the Pliocene of Semarang, Java, is another "species" which very closely resembles the syntypes of *Pseudoneptunea varicosa* and has the spiral threads obsolete on the centre of the body whorl.

#### Family NASSARIIDAE Iredale, 1916

(The validity of the family name is currently under consideration by the I.C.Z.N.).

#### Genus **Nassarius** Duméril, 1806

*Nassarius* Duméril, 1806, Zool. anayt. p. 166. Type species by SM (Froriep, 1806) *Buccinum arcularia* Linnaeus, 1758. Recent, Indo-Pacific.

#### **Cryptonassarius** subgen. n.

TYPE SPECIES. *Nassa ephamilla* Watson, 1882, here designated. Recent, New Zealand and Australia.

Shell up to 19.0 mm in length, thin, ovate to elongate-ovate, body whorl inflated, protoconch of 3½-4 smooth, rounded, convex embryonic whorls, first whorl partly immersed, teleoconch in adult specimens with 3½-4½ (1½-3 in juvenile and immature specimens) weakly or distinctly angulate convex whorls; sutures with a narrow, impressed fine spiral girdle which is more distinct in immature specimens than in adults. Sculptured with axial ribs and overriding spiral threads which produce a granulose sculpture which usually shows considerable wear on first 1-2 mature whorls; interspaces of axial ribs with longitudinal growth-striae. Aperture slightly shorter than the spire, oval, outer lip thin and sharp, varix lacking, aperture neither denticulate nor plicate, columella concave and calloused in mature specimens but callus small, narrow and not spreading, columella edentulous, distal end of columella usually with a thin, elevated ridge, parietal denticle absent. Siphonal canal very abbreviated, siphonal notch distinct and reverted, fossa very shallow, almost non-existent. White to cream in colour, periostracum thin, translucent straw-yellow to light brown in colour. Operculum elongate-ovate with a broad basal nucleus, margins not serrated but weakly corrugate through overlapping growth rings. Radula typically nassarine, with narrow, concave rachidians which bear c. 10 small denticles, laterals bi-cuspid, cutting edge of inward facing cusp with or without minute denticles (see Verco, 1907, pl. 29, fig. 13, and Ponder, 1968, pl. 1, figs. 15, 16).

Among the number of existing and often superfluous generic units in Nassariidae, there is no appropriate subgeneric unit to which *N. ephamillus* could be assigned. The species is usually associated with *Reticunassa* Iredale, 1936 (= *Hima* Leach in Gray, 1852), but it lacks the typically fusiform, solid shape, thick variced outer lip, denticled aperture, parietal fold and produced siphonal canal. It is perhaps closest in morphological features to the West American *Nassarius perpinguis* (Hinds, 1844) the type-species of

*Caesia* H. & A. Adams, 1853, but it lacks the parietal glaze, the apertural denticulation and the distinct fossa of *N. perpinguis*. In the 40 specimens examined, there was no trace of a parietal denticle in *N. ephamillus*.

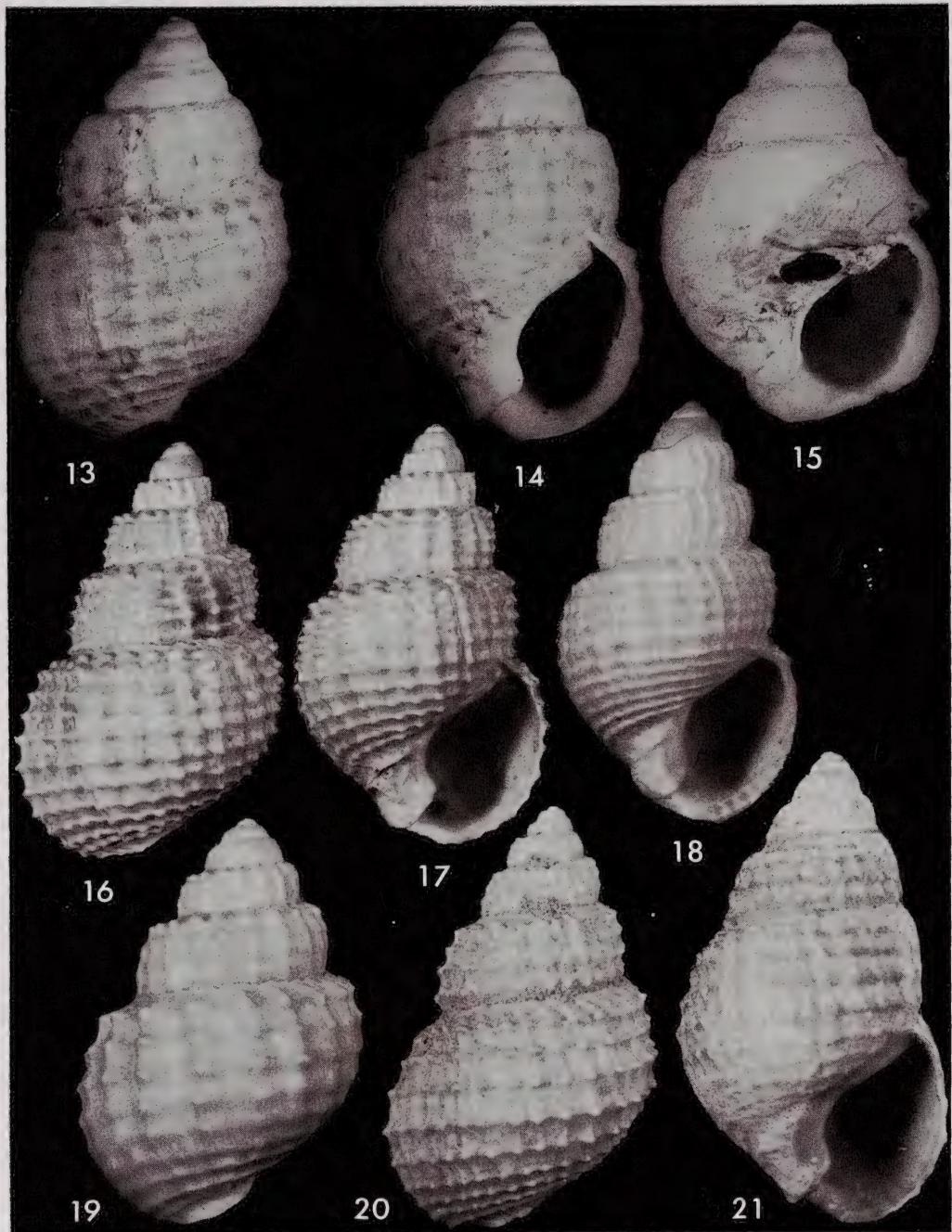
**Nassarius (Cryptonassarius) ephamillus** (Watson, 1822) (Figs. 13-22)

1882. *Nassa ephamilla* Watson, J. Linn. Soc. Lond. 16: 370; 1883 Watson, N.Z. J. Science 1: 442; 1884 Hutton, Trans. Proc. N.Z. Inst 16: 233.
1886. *Nassa dissimilis* Watson, Rept. Sci. Res. Voy. H.M.S. Challenger 15: 175, pl. 17, fig. 6.
1886. *Nassa (Tritia) ephamilla* Watson, Rept. Sci. Res. Voy. H.M.S. Challenger 15: 187, pl. 11, figs. 9a-d.
1906. *Nassa jacksonensis* Quoy & Gaimard, Hedley, Rec. Aust. Mus. 6 (3): 214 (*non Buccinum jacksonianum* Quoy & Gaimard, 1833).
1907. *Arcularia dipsacoides* Hedley, Rec. Aust. Mus. 6 (5): 359, pl. 67, fig. 21; 1907 Verco, Trans. Roy. Soc. Sth. Aust. 31: 214, pl. 29, fig. 13 (radula).
1913. *Alectriion dissimilis* Watson, Suter, Man. N.Z. Mol. p. 396; 1915 Suter, Atlas, pl. 19, fig. 1.
1913. *Alectriion ephamilla* Watson, Suter, *ibid.* p. 396; 1915 Suter, Atlas, pl. 19, fig. 2.
1918. *Nassarius dipsacoides* Hedley, J. Proc. R. Soc. N.S.W. 51: M88; 1932 Cotton & Godfrey, Sth. Aust. Nat. 13 (3): 94.
1938. *Reticunassa flindersi* Cotton & Godfrey, Rec. Aust. Mus. 6 (2): 204, pl. 17, fig. 8; 1938 Cotton & Godfrey, Malac. Soc. Sth. Aust. Publ. No. 1: 24; 1955 Cotton, R. Soc. Sth. Aust. Malac. Sect. No. 7, p. 2, fig. 10.
1951. *Nassarius ephamillus* (Watson), Fleming, Trans. Proc. R. Soc. N.Z. 79 (1): 137; 1956 Dell, Dominion Mus. Bul. No. 18: 109, pl. 13, figs. 127, 128; 1961 Powell, Shells New Zealand, ed. 4: 98; 1968 Ponder, Rec. Dominion Mus. 6: 31, pl. 1, figs. 15, 16 (radula and operculum).
1962. *Reticunassa dipsacoides* (Hedley), Iredale & McMichael, Aust. Mus. Syd. Mem. No. 11: 67.
1962. *Nassarius dissimilis* (Watson), Clarke, Nat. Mus. Canada Bull. No. 181: 26.

TYPE LOCALITY. E. of East Cape,  $37^{\circ} 34' S$  &  $179^{\circ} 22' E$ , 700 fathoms (1281 m), blue mud,  $40^{\circ} F$  ( $4.5^{\circ} C$ ), New Zealand.

DISTRIBUTION. New Zealand to S.E. and S. Australia, 80 to 1100 fathoms (146-2013 m) (Fig. 22).

*Material examined.* New Zealand: E. of East Cape,  $37^{\circ} 34' S$  &  $179^{\circ} 22' E$ , 700 fathoms (1281 m), blue mud (5 syntypes of *N. ephamillus*, B.M.N.H. No. 1887.2.9.666-70); N.E. of Taiaroa Heads, Otago,  $45^{\circ} 45.6' S$  &  $171^{\circ} 05' E$ , c. 300 fathoms (549 m) (Nat. Mus. Wellington & Powell coll.); S.W. of Cape Foulwind, Tasman Sea,  $42^{\circ} 10' S$  &  $170^{\circ} 10' E$ , 610 m (Powell coll.); E. of Cape Turnagain,  $40^{\circ} 28' S$  &  $177^{\circ} 43' E$ , 1100 fathoms (2013 m), blue mud,  $37.2^{\circ} F$  ( $2.9^{\circ} C$ ) (holotype of *N. dissimilis*, B.M.N.H. No. 1887.2.9.591.); S.E. of Cape Palliser, Cook Str.,  $41^{\circ} 42' S$  &  $175^{\circ} 29' E$ , 946-951 m (Nat. Mus. Wellington); off Palliser Bay, Cook Str., 550 fathoms (1007 m) (Nat. Mus. Wellington); S.W. of Cape Palliser, Cook Str.,  $41^{\circ} 44' S$  &  $175^{\circ} 12' E$ , c. 400 fathoms (732 m) (Nat. Mus. Wellington); Chatham Rise,  $43^{\circ} 40' S$  &  $179^{\circ} 28' E$ , 220 fathoms (403 m) (Nat. Mus. Wellington); Chatham Rise,  $43^{\circ} 35.5' S$  &  $177^{\circ} 59' E$ , 320 fathoms (586 m) (Nat. Mus. Wellington); S.E. of Pitt I,  $44^{\circ} 35.5' S$  &  $176^{\circ} 04' W$ , 330 fathoms (604 m) (Nat. Mus. Wellington). Australia: 35 miles E. of Sydney, N.S.W., 800 fathoms (1464 m) (holotype of *N. dipsacoides*, Aust. Mus. Sydney No. C-26624); off Cape Jaffa, Sth. Australia, 300 fathoms (549 m) (holotype of *N. flindersi*, Sth. Aust. Mus. No. D-13298); Encounter Bay, Sth. Australia,  $36^{\circ} 00' S$  &  $138^{\circ} 21' E$ , 450 m (Zool.



Figs. 13-21. *Nassarius (Cryptonassarius) ephamillus* (Watson). 13, 14. Syntypes BMNH No. 1887.2.9.666-70.;  $12.7 \times 7.7$  mm and  $13.6 \times 8.3$  mm respectively. 15. Holotype of *Nassa dissimilis* Watson; BMNH No. 1887.2.9.591.,  $13.5 \times 9.5$  mm (immature and decorticated). 16, 17. Holotype of *Arcularia dipsacoides* Hedley; Aust. Mus. Sydney, No. C-26624,  $11.9 \times 7.2$  mm (immature). 18. Holotype of *Reticunassa flindersi* Cotton & Godfrey; Sth. Aust. Mus. No. D-13298,  $8.8 \times 5.1$  mm (immature). 19, 20. Specimens from Taiaroa Heads, Otago, New Zealand, 300 fathoms (549 m). 19.  $8.5 \times 5.5$  mm (juvenile). 20.  $17.6 \times 11.0$  mm (adult). 21. Specimen from Chatham Rise, New Zealand, 320 fathoms (586 m);  $19.0 \times 11.0$  (adult).

Mus. Copenhagen). Literature records: off Sydney, 300 fathoms (549 m); 22 miles E. of Narrabeen, N.S.W., 80 fathoms (146 m); off Cape Jaffa, Sth. Australia, 130-300 fathoms (238-549 m); 120 miles W. of Eucla, S.W. Australia, 300 fathoms (549 m).



Fig. 22. Distributional map of *Nassarius (Cryptonassarius) ephamillus* (Watson). Black spots indicate locality records of specimens examined.

#### Dimensions

- 8.8 × 5.1 × 4.2 mm — holotype of *Reticunassa flindersi* Cotton & Godfrey
- 11.9 × 7.2 × 5.8 mm — holotype of *Arcularia dipsacoides* Hedley
- 12.7 × 7.7 × 6.6 mm — syntype of *Nassa ephamilla* Watson
- 13.5 × 9.5 × 7.5 mm — holotype of *Nassa dissimilis* Watson
- 13.6 × 8.3 × 7.0 mm — syntype of *Nassa ephamilla* Watson
- 17.6 × 11.0 × 8.8 mm — specimen from Taiaroa Head, Otago, New Zealand
- 19.0 × 11.0 × 8.8 mm — specimen from Chatham Rise, New Zealand

*Variation in sculpture.* Axial ribs on penultimate whorl 15-26, on body whorl 17-30; rows of nodules on penultimate whorl 4-5 (rarely 3), on body whorl 8-12.

#### Variation in the number of whorls with increasing maturity

Length of specimen	No. of mature whorls	No. of embryonic whorls
3.0 - 3.2 mm	1½ - 1¾	4
3.6 mm	1½	3½
4.6 mm	2	3¼
5.0 mm	2	3½
5.2 mm	2	3¼
6.0 mm	2½	3¼
8.5 mm	3	3¾
8.8 mm	3¼	3½
11.9 mm	4	3¾
12.7 mm	3¾	3½
18.6 mm	4½	3¾

While the number of embryonic whorls remains fairly constant in small juveniles and larger adults, there is a noticeable increase in the number of mature sculptured whorls with increasing size and maturity. Small juveniles and immature specimens are

considerably broader than larger more mature specimens which are usually more slender and elongate. This change in shape through the developmental stages of individuals occurs in many other neogastropod families, notably the Mitridae, Vexillidae and Buccinidae.

Watson's type specimens of *Nassarius ephamillus* and *N. dissimilis* have a chalky appearance which is typical of dead-collected specimens. The holotype of *N. dissimilis* is badly decorticated and retains the granulose sculpture only on a small part of the dorsal surface of the body whorl.

Dell (1956) considered *N. ephamillus* to be close to *N. flindersi* (Cotton & Godfrey) and to *N. dipsacoides* (Hedley) from Australia, and expressed his doubts as to the species close relationship to the Indo-Pacific *N. pauperus* (Gould), the type species of *Reticunassa* Iredale (= *Hima* Leach in Gray). Examination of the holotypes of *N. dipsacoides* and *N. flindersi* shows them to be immature individuals of *N. ephamillus* (Watson). The Australian populations can be matched up in all morphological features with the New Zealand populations and cannot be even differentiated subspecifically.

#### ON THE SUBGENUS VENASSA

##### Subgenus **Venassa** von Martens, 1881

*Venassa* v. Martens, 1881, Conch. Mittheil. 2: 109. Type species by M *Nassa* (*Venassa*) *pulvinaris* v. Martens, 1881. Recent, Indonesia.

During a study of Indo-Pacific Nassariidae a certain number of malformed specimens have been encountered which in their distorted shape closely resemble the type specimen of *Nassarius pulvinaris* (v. Martens) (Fig. 25). Examination showed that malformed growth was due to teratological damage visible usually on the spire whorls in the form of fissures and repair scars. Growth on whorls subsequent to where damage occurred became accelerated, with sutures dipping more obliquely and the shell assuming a considerably more fusiform shape. The distortion is most pronounced on the body whorl which becomes more elongate and usually roundly angulate in its anterior third. Malformation is apparent in the distortion of the aperture, with the outer lip twisted and oriented obliquely to the axis, a distorted and often exaggerated columellar callus and a twisted siphonal fasciole. The usually distinct parietal denticle is indistinct and the columella also becomes edentulous. *Nassarius stolidus* (A. Adams, 1852) (= *N. nodiferus* Powys, 1835) (Figs. 23, 24) and *N. distortus* (A. Adams, 1852) (formerly *N. monilis* Kiener, 1834) (Figs. 26, 27), have both been based on the same type of malformed individual as "*Venassa*" *pulvinaris* (v. Martens). Malformation also occurs in temperate water Nassariidae like the S.E. Australian *N. pyrrhus* (Menke) (Figs. 28, 29). The subgenus *Venassa* v. Martens, will become a synonym of *Nassarius* s. lato, and may prove consubgeneric with *Zeuxis* A. Adams, 1852. A slightly distorted specimen of *N. olivaceus* (Bruguière, 1789) examined, bore a close resemblance to the malformed type of *Venassa pulvinaris*, but until a matching malformed specimen of a known species is found, the subgeneric synonymy will remain tentative.

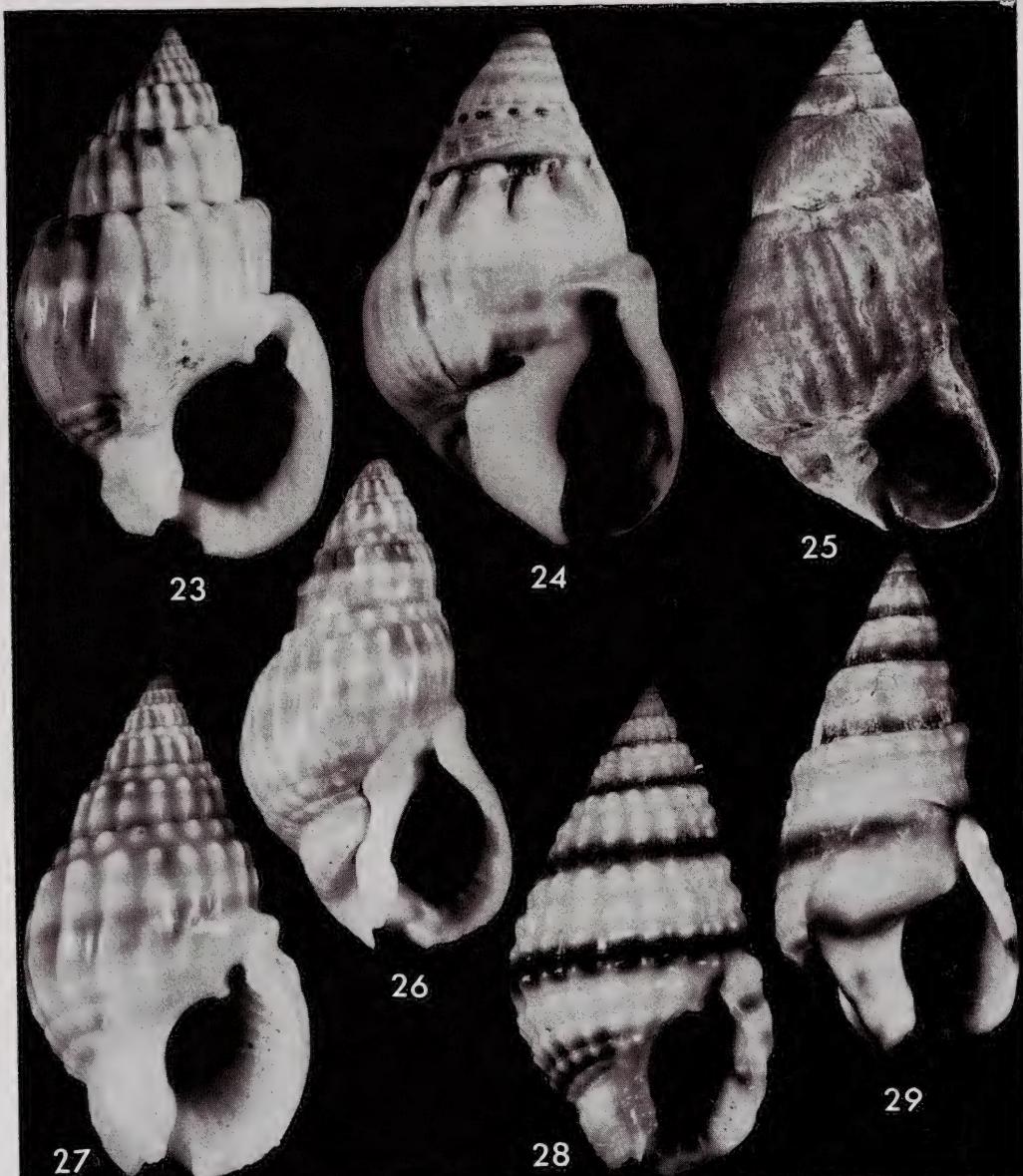
#### Family RISSOIDAE Gray, 1847

##### Genus **Isselia** Semper in Schmeltz, 1874

*Isselia* Semper in Schmeltz, Cat. Mus. Godeffroy 5: 104, 110. Type species by OD *Rissoina mirabilis* Dunker in Schmeltz, 1874 (non Bourguignat, 1877). Recent, Indo-Pacific.

1881. *Isseliella* "Nevill MS" Weinkauff, Syst. Conch. Cab. ed. 2, 1 (22): 61, 67. Type species art. 67 (i) of I.C.Z.N. *Rissoina mirabilis* Dunker in Schmeltz, 1874 (*nom. subst. pro Isselia Semper* in Schmeltz, 1874).

*Isselia* Semper in Schmeltz has 3 years priority over *Isselia* Bourguignat, 1877, and the substitute name *Isseliella* Weinkauff, 1881, is superfluous.



Figs. 23-29. 23, 24. *Nassarius nodiferus* (Powys). 23. Syntype BMNH,  $31.4 \times 19.0$  mm. 24. Holotype of *Nassa stolida* A. Adams; BMNH,  $31.3 \times 19.7$  mm (malformed specimen). 25. Holotype of *Nassa (Venassa) pulvinaris* v. Martens from Atapupu, Timor, Indonesia; Zool. Mus. Humb. Univ. Berlin,  $23.0 \times 14.0$  mm (malformed specimen). 26, 27. *Nassarius distortus* (A. Adams). 26. Syntype BMNH No. 197334,  $26.0 \times 14.2$  mm (malformed specimen). 27. Normal specimen from Namotu Is., Fiji Is.;  $20.0 \times 11.0$  mm. 28, 29. *Nassarius pyrrhus* (Menke). 28. Normal specimen from Semaphore, Sth. Australia;  $19.5 \times 10.6$  mm. 29. Malformed specimen from Parson's Bay, S.E. Tasmania; Tasm. Mus. & Art Gall. No. E-5317;  $20.0 \times 10.0$  mm.

***Isselia semitexta* (Hedley, 1899)**

(Figs. 30-34)

1899. *Nassa semitexta* Hedley, Mem. Aust. Mus. 3 (7): 462, textfig. 37.  
 1907. *Tritonidea seurati* Couturier, J. Conchyl. 55 (2): 137, pl. 2, figs. 1-3 (Hao, Tuamotu Archip.).  
 1907. *Arcularia semitexta* (Hedley), Hedley, Proc. Linn. Soc. N.S.W. 32 (3): 509 (Mast Head reef, Capricorn group, Qld., Australia).  
 1909. *Cantharus semitextus* (Hedley), Hedley, Aust. Assoc. Adv. Sci. No. 138/139: 367.  
 1922. *Stossichia intertexta* (Hedley), Bavay, Bull. Mus. Nat. d'Hist. Nat. (1), 28: 425.  
 1922. *Stossichia seurati* (Couturier), Bavay, Bull. Mus. Nat. d'Hist. Nat. (1), 28: 425.

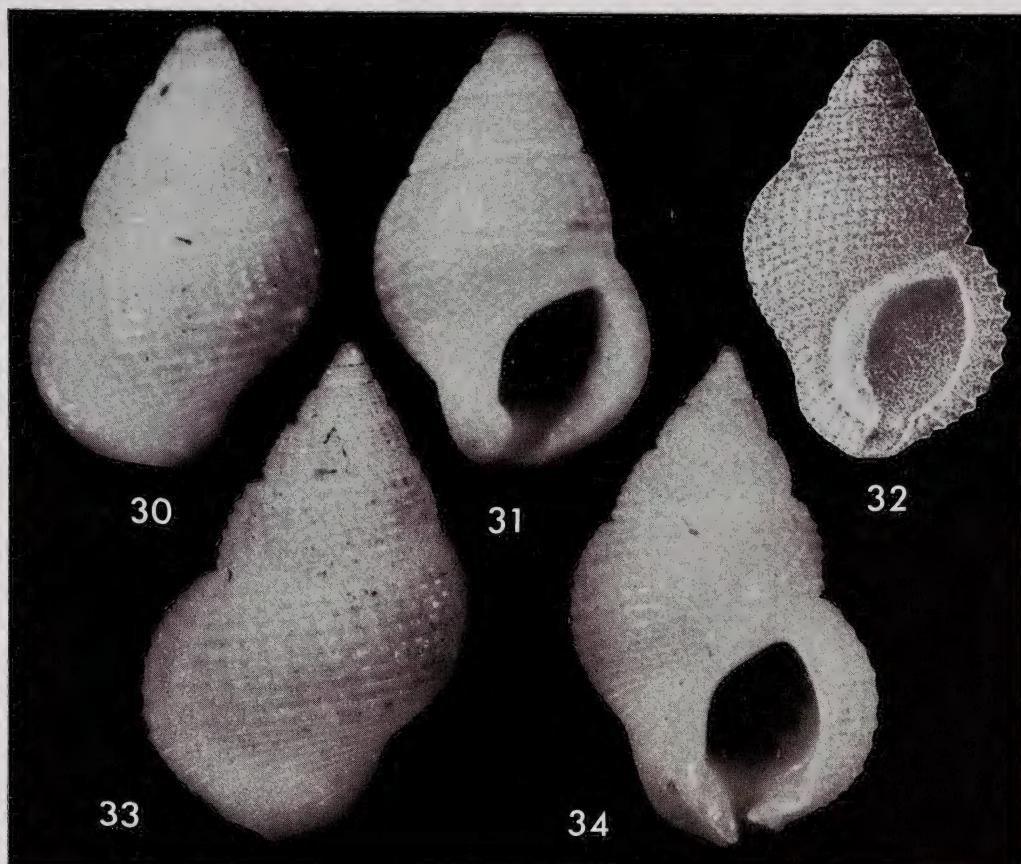
TYPE LOCALITY. Funafuti, Ellice Is.

DISTRIBUTION. Tuamotus to Queensland, Australia.

Shell small, 5.0-7.0 mm in length, ovate, milky-white in colour, mature whorls 5-5½, embryonic whorls partly missing in specimens examined. Spire whorls only weakly convex, sutures deeply incised and "V"-shaped in profile, sculptured with fine, slender axial riblets which number from 23-25 on the penultimate and from 22-26 on the body whorl, axial riblets becoming obsolete on the anterior half of the body whorl. Fine spiral threads override axial riblets and produce a granulose sculpture at the point of intersection; spirals number 6 on the penultimate and from 22-25 on the body whorl and c. 16 of the anterior cords are smooth. Outer lip prominently variced, aperture ovate, interior with 12 fine striae; columella calloused and smooth, callus impressed and slightly spreading anteriorly, anterior of columella with a single fold and a distinct kink which causes the siphonal fasciole and anterior of columella to twist toward the aperture, siphonal notch distinct and moderately broad.

Hedley (1899) based his description on two very worn specimens from Funafuti, Ellice Is, and his original figure shows a shell which appears to be in considerably better state of preservation than his actual types in the Australian Museum, No. C-6020, dimensions 5.9 × 3.6 × 3.5 mm and 5.9 × 3.8 × 3.7 mm. Hedley (*op. cit.*) expressed his doubts as to the correct assignment of the species to *Nassa* (= *Nassarius*) and commented on the rissoinid appearance of his new species. Hedley (1907) reported the species from Mast Head reef, Australia. Couturier (1907) unaware of Hedley's prior description, re-described the species as *Tritonidea seurati*, assigning it to the Buccinidae. Couturier's specimen came from Hao, Tuamotus, and measured 6.0 × 4.0 mm (Fig. 32).

Through the courtesy of Dr H. A. Rehder, Smithsonian Institution, Washington, I was able to examine a recently collected specimen from dredged land fill of the Patutoa district of Papeete, Tahiti, dimensions 6.6 × 4.0 × 3.8 mm (Figs. 33, 34). This comparatively little known but widely distributed Pacific species is not a nassarid nor a buccinid but belongs to the genus *Isselia* Semper in Schmeltz, 1874, family Rissoidae. Bavay (1922) correctly placed "*Nassa semitexta*" in the Rissoidae but erroneously associated the species with *Stosicia* Brusina, 1870, whose type is the quite different species *Rissoa planaxoides* Desmoulin in Grateloup, 1838, from the European Miocene. "*Stossichia serrei* Bavay, 1922" from Colón, Panama, is also an *Isselia* which closely resembles the Caribbean *Rissoa aberrans* C. B. Adams, 1850, a species which is usually assigned to *Alvania* Risso, but probably belongs to *Isselia*.



Figs. 30-34. *Isselia semitexta* (Hedley). 30, 31. Syntypes, Aust. Mus. Sydney, No. C-6020;  $5.9 \times 3.6$  mm and  $5.9 \times 3.8$  mm respectively. 32. Type figure of *Tritonidea seurati* Couturier;  $6.0 \times 4.0$  mm (after Couturier 1907). 33, 34. Specimens from Patutoa, Papeete, Tahiti; USNM No. 669585,  $6.6 \times 4.0$  mm.

#### Family VOLUTOMITRIDAE

##### Genus **Microvoluta** Angas, 1877

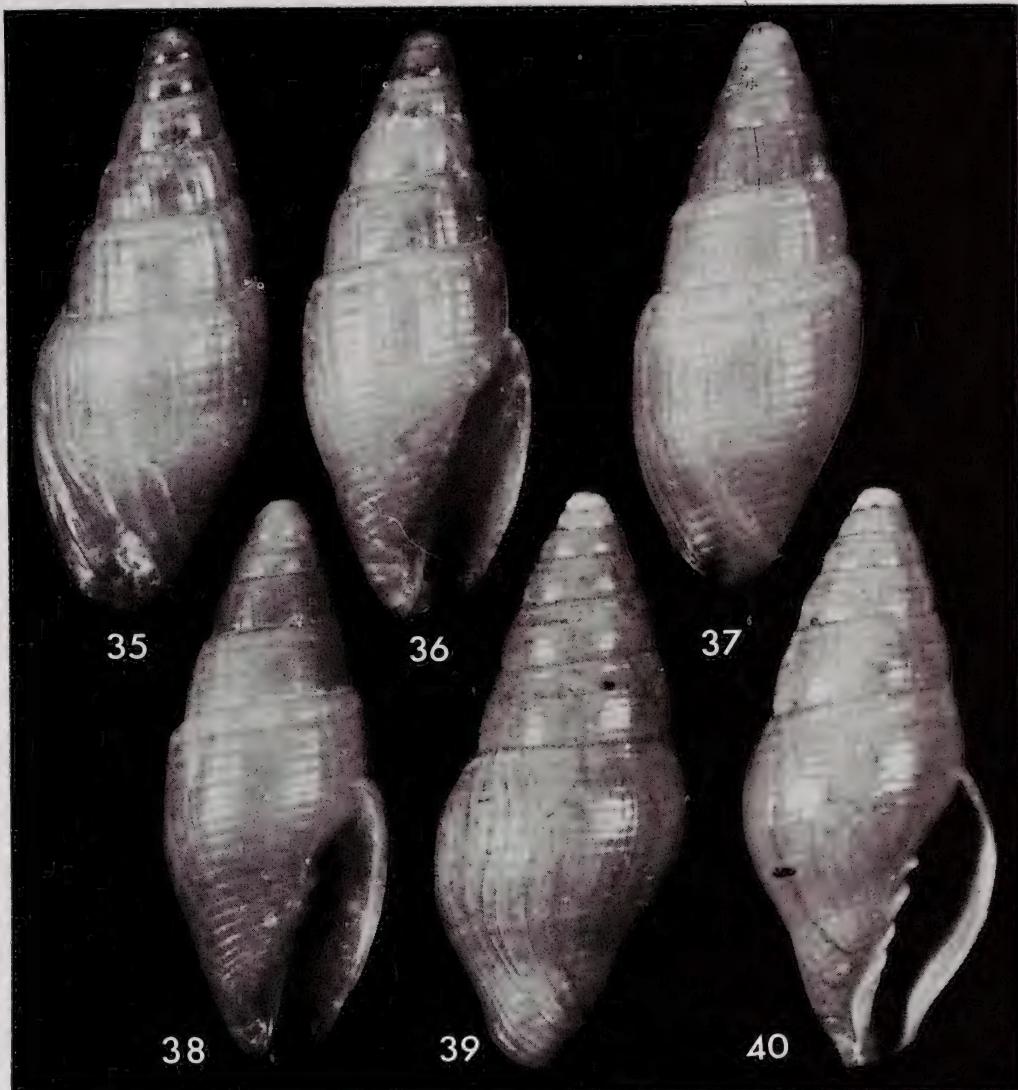
*Microvoluta* Angas, 1877, Proc. Zool. Soc. Lond. p. 34. Type species by M. M. *australis* Angas, 1877. Recent, S.E. Australia.

##### **Microvoluta garrardi** sp. n.

(Figs. 35-38, 41)

Shell very small,  $6.0-8.0$  mm in length, fusiformly-elongate, width 38%-42% of length. Protoconch of  $2-2\frac{1}{2}$  smooth, glassy-white globose nuclear whorls, teleoconch of  $4-4\frac{1}{2}$  very weakly convex or almost straight-sided whorls; sculptured with numerous, irregularly sized and spaced narrow axial ribs and finely incised spiral grooves which produce flat spiral cords. Spiral grooves number from 5-6 on the penultimate and from 12-16 on the body whorl in addition to the 6-7 more elevated, oblique cords on the anterior third of the body whorl; a deep presutural spiral groove gives rise to a narrow sutural girdle which is usually irregularly and weakly nodulose through the intrusion of the axial riblets. Aperture only slightly longer than the spire, narrow, smooth within, outer lip thin and simple, only weakly constricted basally, columella concave, slightly calloused anteriorly, sculptured with 4 distinct, distant folds, first posterior fold shorter

than subsequent fold. Siphonal canal short, ill-defined and spout-shaped, siphonal notch absent. Light brown or fawn in colour, ornamented on the body whorl with 2 broad, ill-defined darker brown transverse bands on which are superimposed delicate zig-zag axial lines and some small white spots.



Figs. 35-40. 35-38. *Microvoluta garrardi* sp.n., N.E. of Cape Moreton, Qld., Australia, 114-124 m. 35, 36. Holotype Aust. Mus. Sydney, No. C-96235;  $7.0 \times 2.7 \times 3.6$  mm. 37, 38. Paratype Auckland Inst. Mus.;  $6.8 \times 2.7 \times 3.6$  mm. 39, 40. *M. pentaploca* Finlay, Mornington, Balcombe Bay, Miocene Victoria, Australia;  $7.4 \times 3.0 \times 4.0$  mm.

**TYPE LOCALITY.** Northeast of Cape Moreton, Queensland, Australia, 114-124 metres.

**Holotype.** In the Australian Museum, Sydney, No. C-96235; length 7.0 mm, width 2.7 mm, height of aperture 3.6 mm (Figs. 35, 36).

**Paratypes.** Paratype No. 1, dimensions  $6.8 \times 2.7 \times 3.6$  mm, in the Auckland Institute and Museum, Auckland; paratypes Nos. 2-12 in the Australian Museum, Sydney.

*Microvoluta australis* Angas, 1877, another recent Australian volutomitrifid species (Fig. 49) is appreciably broader, smooth or weakly spirally sculptured, lacks the sutural girdle, has a more inflated body whorl and more convex spire whorls. *M. garrardi* is perhaps most similar to the Victorian Miocene *M. pentaploca* Finlay, 1927, but this species is also broader and the sculpture consists of curved axial growth-lines rather than axial riblets and although a sutural girdle is present, the presutural groove is narrower and more shallow, the body whorl is more inflated, the outer lip is prominently constricted anteriorly and all specimens examined were prominently lirate within the aperture (Figs. 39, 40).

*M. garrardi* has been named for Mr Thomas Garrard, Sydney, for his valuable contributions to Australian malacology.

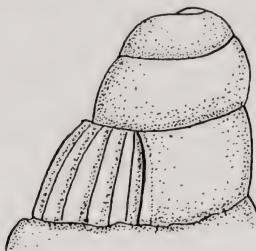


Fig. 41. *Microvoluta garrardi* sp. n. Protoconch.

**Microvoluta ponderi** sp. n.

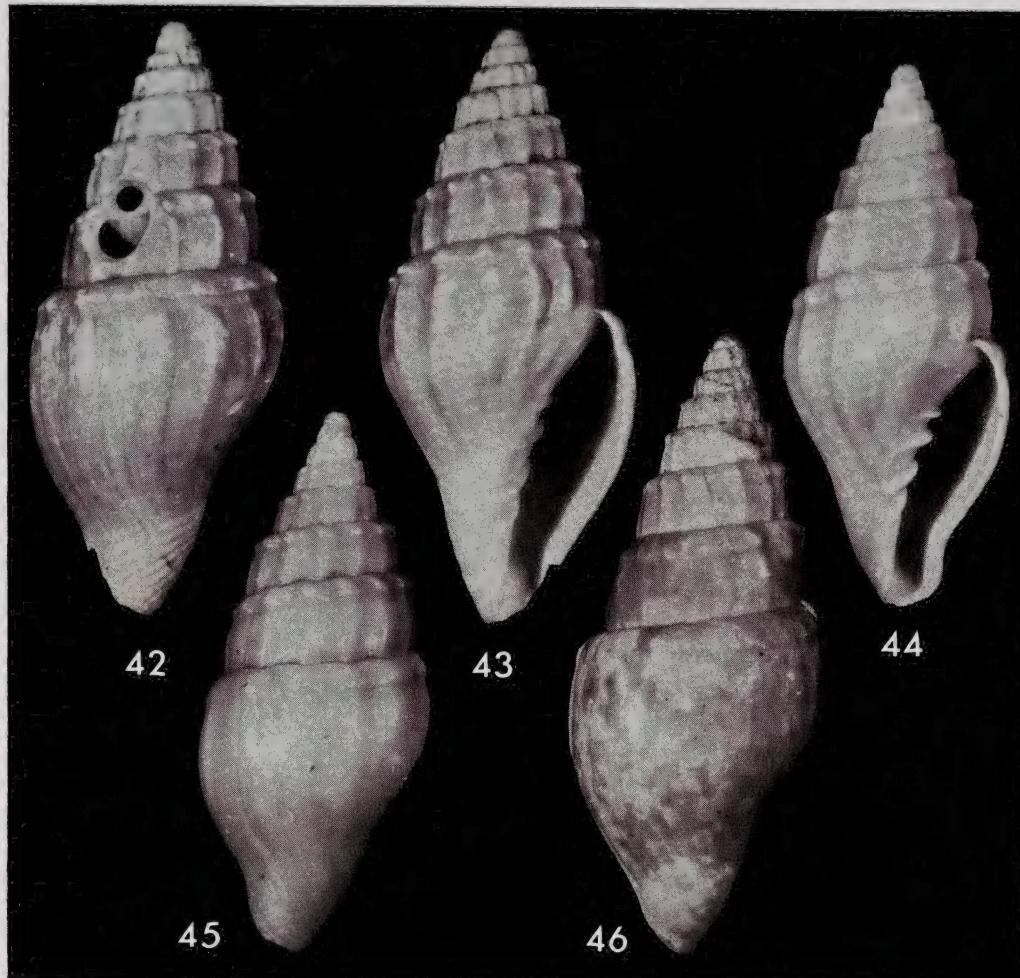
(Figs. 42-46)

Shell small, 8.0-12.0 mm in length, fusiformly-elongate, width 40%-46% of length. Protoconch of 2-2½ smooth, glassy, globose embryonic whorls, teleoconch of 5-6½ weakly convex whorls which are angulate at the sutures; sculptured with straight or slightly arcuate, angulate axial ribs which number from 12-17 on the penultimate and from 12-15 on the body whorl; a moderately deep presutural groove subdivides axial ribs into bluntly coronate sutural nodes. The axial ribs may become weak or almost obsolete and irregular-sized on the body whorl and sometimes appear like growth-striae which curve in the direction of the siphonal fasciole. Except for the presutural groove and 5-9 fine, oblique and close-set spiral cords on the siphonal fasciole, spiral sculpture is lacking. Aperture about equal in height to the spire, narrow, interior with 2-13 lirae, outer lip thin, convex and constricted anteriorly; columella not calloused except for a small calloused tip on the anterior of the columella which is concave and has 4-5 distant thin folds, first posterior fold shorter than subsequent fold. Siphonal canal somewhat produced and distinctly spout-shaped, siphonal notch lacking. Uniformly white in colour under a straw-yellow, thin and opaque periostracum.

**TYPE LOCALITY.** East of Port Jackson, New South Wales, Australia, 118 metres (ex-“Challenge”).

**Holotype.** In the Australian Museum, Sydney, No. C-98330; length 11.0 mm, width 4.8 mm, height of aperture 5.7 mm (Figs. 42, 43) [the holotype is holed on the penultimate whorl on the dorsal side].

**Paratypes.** Paratype No. 1, dimensions 10.0 × 4.0 × 5.2 mm from the type locality in the Auckland Institute and Museum, Auckland; paratype No. 2 from the type locality and paratypes Nos. 3-5 (C-67478) from CSIRO St. G3/201/60, off Sydney, N.S.W., 366 m, in the Australian Museum, Sydney (largest paratype 12.3 × 5.0 × 6.0 mm).



Figs. 42-46. *Microvoluta ponderi* sp. n. 42-45. E. of Port Jackson, N.S.W., Australia, 118 m. 42, 43. Holotype Aust. Mus Sydney, No C-98330; 11.0 × 4.8 × 5.7 mm. 44, 45. Paratype Auckl. Inst. Mus.; 10.0 × 4.0 × 5.2 mm. 46. Paratype from off Sydney, N.S.W., 366 m; Aust. Mus. Sydney, No. C-67478; 12.3 × 5.0 × 6.0 mm.

*Microvoluta ponderi* is the only living *Microvoluta* species with a sutural row of bluntly coronate nodules. The closest relative appears to be the New Zealand species *M. marginata* (Hutton, 1885), but in this species, like in some Eocene-Miocene *Proximitra* species, the nodules are situated a considerable distance anteriorly to the sutures, usually on the presutural ramp. In sculpture the species is closest to the New Zealand Miocene *Proximitra fracta* (Marwick, 1926), a species which has only 2½-2½ mature whorls and has obviously been based on a juvenile specimen. In *P. fracta* the sutural nodules on the penultimate whorl are adjoining each other and are so large that they occupy half the height of the whorl.

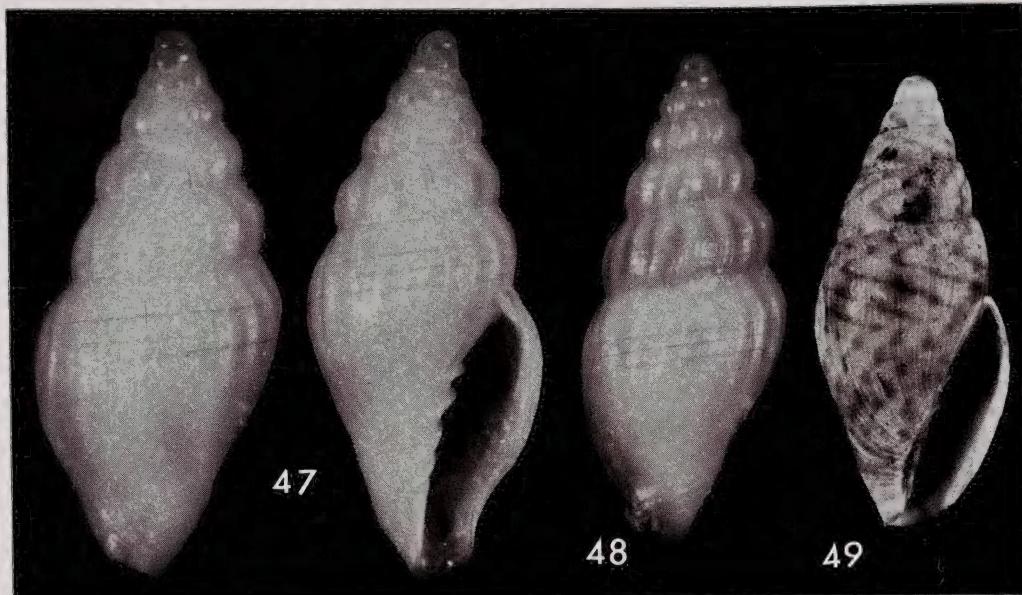
*M. ponderi* has been named for Dr Winston Ponder, Curator of Molluscs, Australian Museum, Sydney, for his contributions to research on New Zealand and Australian Mollusca.

**Microvoluta stadialis** (Hedley, 1911)

(Figs. 47, 48)

1911. *Mitra stadialis* Hedley, Zool. Res. Fish. Exp. "Endeavour", Pt. 1: 112, pl. 20, fig. 37.  
 1932. *Austromitra stadialis* (Hedley), Cotton & Godfrey, Sth. Aust. Nat. 13 (2): 79; 1957  
 Cotton, Roy. Soc. Sth. Aust. Malac. Sect. No. 12: 5, fig. 15; 1959 Cotton, Sth. Aust.  
 Moll. in Handb. Flora Fauna Sth Aust, p. 386; 1962 Macpherson & Gabriel, Mar.  
 Moll. Victoria No. 2: 209.

TYPE LOCALITY. 40 miles (64 km) south of Cape Wiles, Sth. Australia, 100 fathoms  
 (183 m).



Figs. 47-49. 47, 48. *Microvoluta stadialis* (Hedley), 40 miles (64 km) Sth. of Cape Wiles, Sth. Australia, 100 fathoms (183 m); paratypes Aust. Mus. Sydney, No. C-31990, 8.0 × 3.7 × 4.4 mm and 7.1 × 2.9 × 3.6 mm respectively. 49. *M. australis* (Angas), off Cronulla, N.S.W., Australia, 40-100 m; 8.5 × 3.7 mm.

The species has been placed in the vexillid genus *Austromitra* Finlay, by Australian authors, but examination of paratypes of *Mitra stadialis*, Australian Museum, Sydney, No. C-31990, prove the species to be a *Microvoluta* with a concave columella, thin wide-spaced columellar folds with the first posterior fold smaller than the subsequent fold, a spout-shaped siphonal canal and a microvolutine protoconch. To the original description can be added that the spiral sculpture consists of 3-4 thin and shallow spiral grooves situated about centrally on the spire whorls and anteriorly to the suture on the body whorl; 2-3 orange-brown spiral lines are usually impressed in the grooves.

### Family TURRIDAE

#### Subfamily RAPHITOMINAE Bellardi, 1875

(= *Daphnellinae* Casey, 1904 = *Pleurotomellinae* Nordsieck, 1968)

#### Genus *Eucyclotoma* Boettger, 1895

*Eucyclotoma* Boettger, 1895, Nachricht. deut. Malak. Gesell. 27: 55. Type species by SD (Cossman, 1896) *Clathurella bicarinata* "Reeve" = *C. bicarinata* Pease, 1863. Recent, Pacific.

1924. *Turrhyssa* Dall, Proc. Biol. Soc. Washington 37: 88. Type species by OD *Clathurella bicarinata* Pease, 1863.

**Eucyclotoma hindsii** (Reeve, 1843)

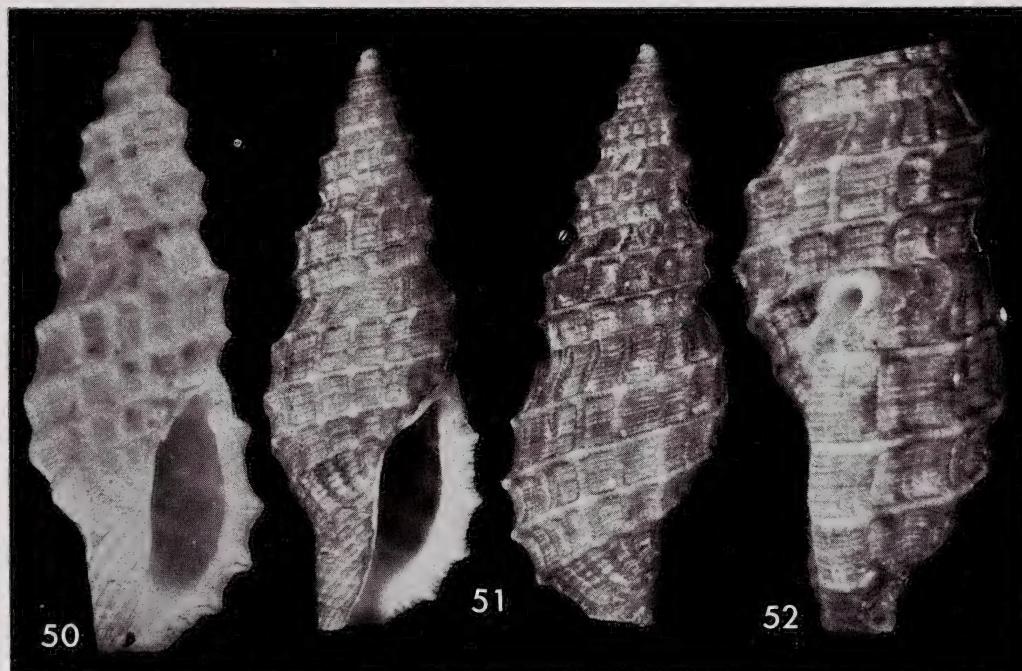
(Figs. 50-53)

1843. *Pleurotoma hindsii* Reeve, Conch. Icon. 1: pl. 14, fig. 119.  
 1884. *Clathurella hindsii* Reeve, Tryon, Man. Conch. 6: 289, pl. 17, fig. 12.  
 1952. *Eucyclotoma hindsii* (Reeve), Kuroda & Habe, Check-list Bibl. Rec. Mar. Moll. Japan, p. 56; 1966 Powell, Bull. Auckland Inst. Mus. No. 5: 130.

TYPE LOCALITY. Baclayon, Bohol I, Philippines.

Shell c. 10.0 mm in length, fusiform, with 5½ mature whorls and almost 2 embryonic whorls which are sculptured with dense, minutely granulose striae. Sculpture latticed, early mature whorls with 2 elevated spiral cords, body whorl with 4 cords, axial sculpture consisting of c. 15-16 cords which are slightly arcuate on the presutural ramp and then descend vertically on to the spiral cords; window-like interspaces of cords with a slightly finer central thread and additional fine spiral striae. Labial sinus deep and tilted, outer lip thickened and minutely plicate on the edge, columella almost vertical, smooth, siphonal canal moderately produced, fasciole obliquely striate. Brown in colour, spiral cords paler, protoconch light fawn, aperture bluish-white.

The species has remained unfigured and the protoconch was unknown. Recent specimens have been collected at Crash boat Basin, Apra Harbour, Guam I, Marianas Is, in 15 feet (4.6 m) under rock and coral rubble (leg. R. Salisbury). The species has been previously reported from the Philippines and Japan.



Figs. 50-52. *Eucyclotoma hindsii* (Reeve). 50. Type specimen from Baclayon, Bohol I, Philippines; BMNH, dimensions not available (negative by courtesy Dr A. W. B. Powell). 51, 52. Specimen from Apra Harbour, Guam I, Marianas Is; 10.6 × 3.8 × 5.0 mm.

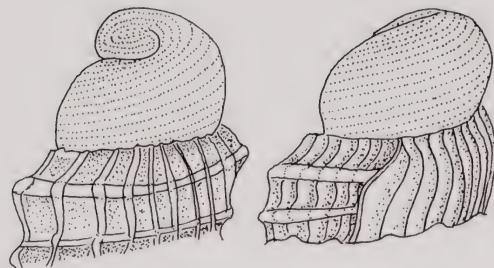
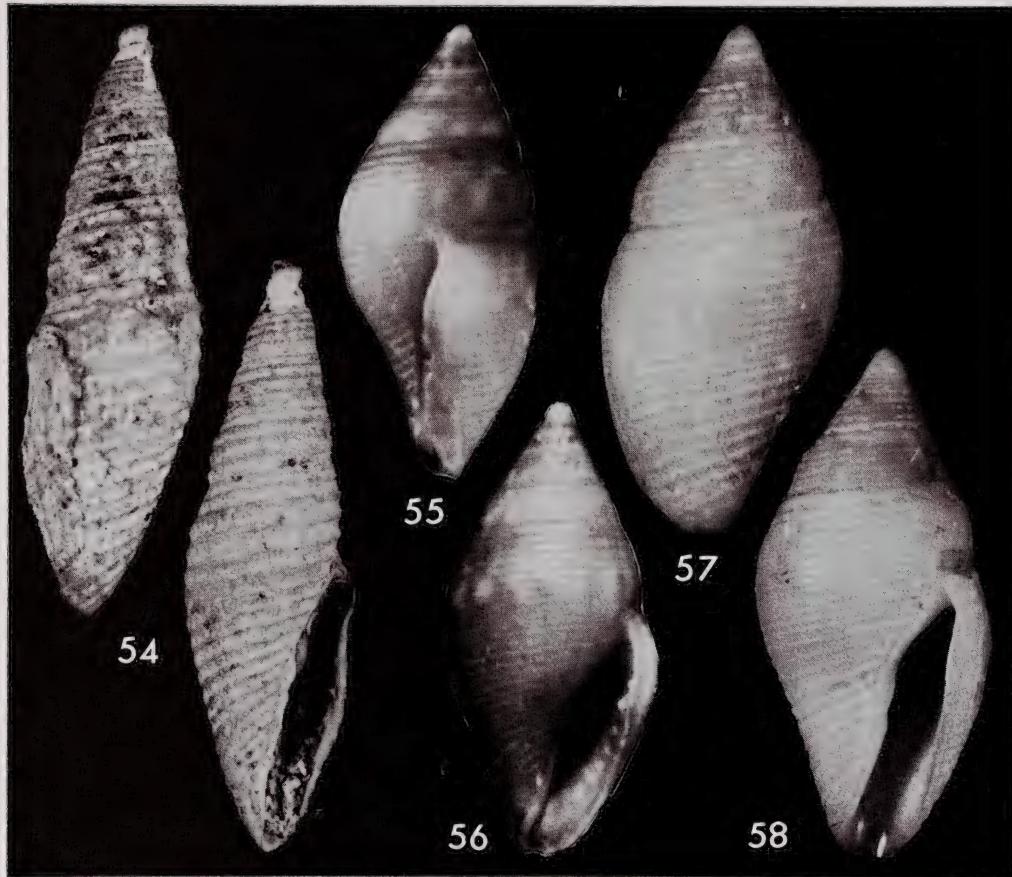


Fig. 53. *Eucyclotoma hindsii* (Reeve). Protoconch.

Subfamily MITROMORPHINAE Casey, 1904

1888. Diptychomitrinae Bellardi, Mem. R. Accad. Sci. Torino 39: 152 (*nomen oblitum*).  
 1904. Mitromorphini Casey, Trans. Acad. Sci. St. Louis 14(5): 126, 169 (19th May 1904).  
 1904. Mitrolumnidae Sacco, Moll. terr. terz. Piem. Liguria Pt. 30: 88 (August 1904).



Figs. 54-58. 54. "Mitra (Subcancilla)" *musa* Olsson, Quebrada Camarones, Esmeralda form., Mio-Pliocene of Ecuador; holotype USNM No. 643951,  $20.0 \times 6.0 \times 10.0$  mm.  
 55, 56. *Mitrolunna olivoidea* (Cantraine); lectotype Inst. Roy. Sci. Nat. Brussels,  $8.3 \times 4.1$  mm (photo courtesy Dr W. Adam, Brussels). 57, 58. *M. alba* (Petterd), Western Port, Victoria, Australia, 5-10 fathoms (9-18 m);  $6.2 \times 3.2$  mm.

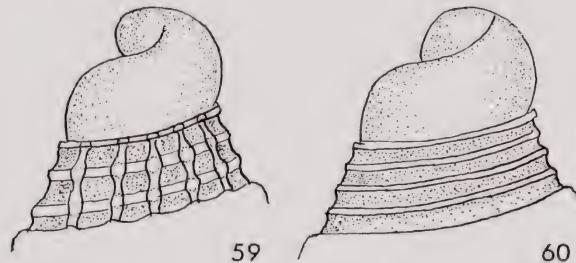
Genus **Mitrolumna** Bucquoy, Dautzenberg & Dolfuss, 1883

*Mitrolumna* Bucquoy, Dautzenberg & Dollfus, 1883, Mol. mar. Roussillon 1 (3): 115, 121.  
Type species by OD *Mitra olivoidea* Cantraine, 1835. Recent, Mediterranean.

1922. *Mitrithara* Hedley, Rec. Aust. Mus. 13 (6): 233. Type species by OD *Columbella alba* Petterd, 1879. Recent, S.E. Australia.

The recent report of a new species of *Mitrolumna* from the Galápagos Is by Emerson and Radwin (1969) extend the geographical range of the formerly monotypic genus *Mitrolumna* from the Mediterranean and West Africa to the Eastern Pacific. Emerson and Radwin (*op. cit.*) gave a detailed history of *Mitrolumna* and remarked that the existence of the Galapagan *Mitrolumna keenae* Emerson & Radwin, 1969, seemingly presents zoogeographic incongruities. However, this zoogeographic anomaly will be resolved if other genera closely resembling *Mitrolumna* are re-examined in the light of new evidence.

The S.E. Australian turrid genus *Mitrithara* Hedley, 1922, has been disassociated from *Mitrolumna* mainly on the assumption that *Mitrolumna* was confined to European waters. A detailed comparison, however, of the type species *Mitrithara alba* (Petterd) and *Mitrolumna olivoidea* (Cantraine), has failed to disclose characters which would merit a separation of these two genera. Both species have an ovate-biconic shell, a bi-plicate columella, a weak sutural sinus, a posteriorly indented outer lip, a wide, unnotched siphonal canal and a predominantly spiral sculpture which may occasionally become granulose, especially on the spire whorls (Figs. 55-58). The protoconchs are also basically similar, with *Mitrolumna* having only a slightly more narrowly dome-shaped protoconch than *Mitrithara* (Figs. 59, 60).



Figs. 59, 60. Protoconchs. 59. *Mitrolumna olivoidea* (Cantraine). 60. *M. alba* (Petterd).

Two groups appear to be represented in the Mitromorphinae: the *Mitrolumna* group, which includes species with a bi-plicate columella and contains the subgenera *Helenella* Casey, 1904, *Cymakra* Gardner, 1937, and *Arielia* Shasky, 1961. The group of *Mitromorpha* Carpenter, 1865, includes species with an edentulous columella and should embrace the Indo-Pacific subgenus *Lovellona* Iredale, 1917, as suggested by Orr-Maes (Orr, 1959).

**"Mitra (Subcancilla)" musa** Olsson, 1964

(Fig. 54)

1964. *Mitra (Subcancilla) musa* Olsson, Neog. Moll. N.W. Ecuador p. 132, pl. 38, fig. 12 only.

TYPE LOCALITY. Quebrada Camarones, Esmeralda formation, Mio-Pliocene of Ecuador.

Olsson's (1964) diagnosis of *M. (C.) musa* is a composite description based on two different species. The holotype illustrated by Olsson (*op. cit.*, pl. 38, fig. 12) is actually a mitromorphine turrid whereas the paratype (*op. cit.*, pl. 38, fig. 11) is a juvenile mitrid *Subcancilla*. The description of the protoconch, number of spirals and 3 columellar plaits have been based on the juvenile *Subcancilla* species and not the turrid holotype. The holotype of *musa* in the National Museum of Natural History, Washington, No. 643951 (dimensions 20.0 × 6.0 × 10.0 mm), is a fusiformly biconic shell of 4½ mature whorls and a remnant of c. 2½ embryonic whorls of a form unknown in the Mitridae. Contrary to the original description, the spire is not considerably longer than the aperture but equal in height, the penultimae whorl has 5 spiral cords and the body whorl 19. The aperture is narrow and elongate, the labial sinus is represented by an indentation of the outer lip near the suture, the columella has only 2 medial, typically mitrolumnine folds of which the posterior one is larger and swollen and the anterior one smaller. The siphonal canal lacks the mitrid siphonal notch and is spout-shaped and the anterior end of the columella has a slight twist towards the aperture. Features of protoconch, indented outer lip, bi-plicate columella and spout-shaped siphonal canal exclude an assignment of the holotype of *musa* to *Subcancilla* or any other genera of the Mitridae. The species belongs in the Mitromorphinae and generically resembles the living species *Arielia mitriformis* Shasky, 1961, from the Gulf of California. The latter species, however, has an overall reticulate sculpture whereas *musa* is clathrate only on the first two post-embryonic whorls and the sculpture becomes predominantly spiral on the last 2 whorls.

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